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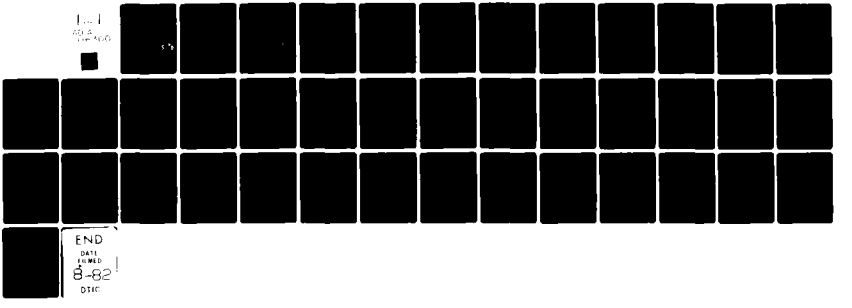

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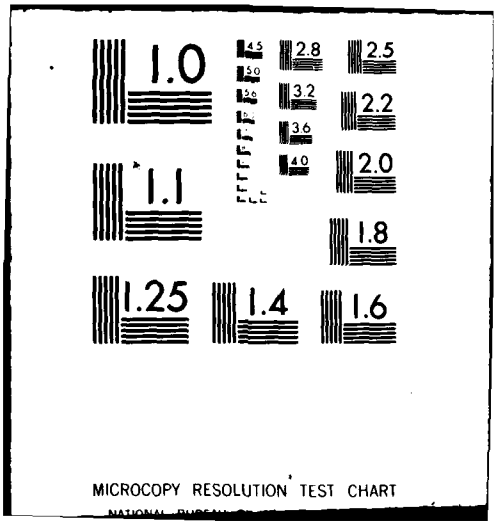
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A Meta-Analysis of the Correlates of Role Conflict and Ambiguity[1]

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The correlational literature concerning the relationships of role conflict and ambiguity to numerous hypothesized antecedents and consequences is still somewhat unclear after a decade of research. Schmidt-Hunter meta-analysis procedures were applied to the results of 43 past studies in an effort to draw valid conclusions about the magnitude and direction of these relationships in the population. For some correlates, apparently inconsistent research results could be ascribed largely to statistical (continued)

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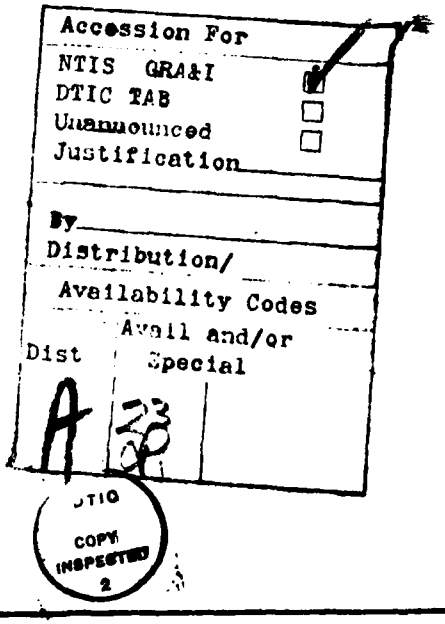
artifacts. For other correlates, it seems that moderator research is needed to explain conflicting results across samples.



In the last twelve years, there has been a great deal of correlational research on the relationships between perceived role ambiguity and role conflict and a host of hypothesized antecedents (such as tenure, formalization, boundary spanning) and consequences (such as job satisfaction, performance, tension, propensity to leave the job, etc.). We located 43 studies, largely in the published literature, which dealt with this topic. Despite all this research, definitive conclusions about these relationships are hard to reach, as results have often seemed inconsistent from study to study (see Van Sell, Brief, and Schuler, 1981, for a review). In most cases, these "inconsistent" results consist of some significant correlations of the same sign, and others which are nonsignificant or zero. Only rarely have significant positive relationships been reported in some studies and significant negative relationships found in other studies of the same variables. However, the true magnitude of the various relationships is still unclear.

In response to these inconsistent results, researchers have begun to search for moderator variables to explain why observed relationships vary across studies. Moderators which have been tested include need for achievement (Abdel-Halim, 1980; Johnson and Stinson, 1975), locus of control (Abdel-Halim, 1980; Organ and Greene, 1974), job scope (Abdel-Halim, 1978, 1980, 1981), need for role clarity (Lyons, 1971; Stead and Scamell, 1980; Ivancevich and Donnelly, 1974), tenure (Brief, Aldag, Van Sell, Melone, 1979), higher order need strength (Beehr, Walsh, and Taber, 1976; Brief and Aldag, 1976), and organizational/occupational level (Schuler, 1975; Berkowitz, 1980; Morris, Steers, and Koch, 1979; Szilagyi, 1977; Szilagyi, Sims, and Keller, 1976). The results of moderator studies have also been

conflicting and inconclusive, and consequently have added little to our understanding.

Recently, a set of methods has become available which allows quantitative cumulation of results across studies, and facilitates the reaching of accurate conclusions based on many past studies of the same phenomenon. These methods are collectively called meta-analysis. Glass (1976) coined this phrase and developed some useful procedures, and others (Rosenthal, 1978, 1979; Cooper, 1979) have subsequently enlarged on them. Schmidt, Hunter, and their colleagues (Hunter, Schmidt, and Jackson, Note 1; Schmidt and Hunter, 1977; Schmidt, Hunter, Pearlman, and Shane, 1979) have developed some additional procedures for cumulating evidence across studies. The various developers of meta-analysis suggest that some form of meta-analysis be applied in virtually <u>all</u> literature reviews, to facilitate the drawing of more correct inferences across studies. Cooper and Rosenthal (1980, p. 442) state, "Because literature reviews have such great gate-keeping potential, it is crucial that we apply standard, replicable, and rigorous criteria to them ... the traditional method of literary review has been criticized because of a lack of just such quality control ... statistical procedures have been suggested as an alternative ..."

Meta-analysis methods are rapidly increasing in use in education and psychology, but are just beginning to be applied in the area of organizational behavior (c. f. Schwab, Olian-Gottlieb, and Heneman, 1979; Strube and Garcia, 1981). The exception is Schmidt and his colleagues, who originally developed their meta-analysis methods specifically to assess the validity generalizability of employee selection tests. In the area of role conflict and ambiguity and their

correlates, meta-analysis can readily be applied to the literature with the expectation that it will substantially clarify our interpretation of past results.

Meta-analysis

There are many methods available for cumulating results across studies (c.f. Hunter et al., Note 1; Rosenthal, 1978). Some rely simply on counting the number of studies displaying significance and comparing to the number which are nonsignificant. A somewhat more complex procedure is to add significance levels across studies. However, this method gives no estimate of effect size, and does not consider the joint role of effect size and sample size in determining significance. Still more sophisticated methods involve cumulating effect sizes. Schmidt, Hunter, and their colleagues have developed such a method specifically for use with correlational data. Their methods has the added advantage of recognizing and correcting for some of the artifactual and methodological problems affecting the observed results of the studies to be combined. Schmidt-Hunter methods will be used in this paper, and are explained more fully below.

Schmidt-Hunter meta-analysis is based on the idea that much of the variation in results across samples or studies is due to statistical artifacts and methodological problems rather than to truly substantive differences in underlying population correlations. The former include sampling error due to differences in sample size, differential reliability and construct validity of measures across samples, differential restriction in range across samples, and errors in data coding, keypunching, and analysis. Their method involves first calculating the mean correlation across studies. In arriving at

this mean, individual correlations are weighted by sample size, so that results of large samples are more heavily weighted than results of small samples. The rationale for this procedure is that correlations from large samples are more reliable (have a smaller confidence interval), and are likely to better represent the true population value than are correlations from small samples. The frequency-weighted mean correlation ($\bar{r}$) is considered the best estimate of the population correlation, if existing instruments were actually used to measure the population. For example, we found that the mean correlation between job involvement and role ambiguity was -.26, based on the results of eight studies with 1,354 total subjects.

Once the observed $\bar{r}$ is obtained, the total variance of sample correlations around this value is calculated. (In a traditional literature review, a large variance would be interpreted to mean that one or more moderator variables are needed.) The variance attributable to artifacts is then calculated (see Hunter, et al., Note 1, for formulas) and subtracted from the total variance. As noted above, variance due to artifacts comes from several sources. One source is variance expected due to sample sizes. This is easy to compute, but obtaining figures for variance due to other sources such as differential unreliability or restriction in range is often impossible since many authors fail to report the necessary information. Quantitative data on the construct validity or similarity of factor structures of different measures of the same construct is virtually never available, and it is obviously not feasible to calculate variance due to coding and analysis errors. Thus, variance due to artifacts is always a <u>conservative</u> estimate. When variance due to artifacts is subtracted from total variance, the

remaining unexplained variance is often very small, indicating that apparently "inconsistent" results across studies are not truly inconsistent, but occur only because of statistical artifacts. In such cases, moderators are not needed (assuming that the studies meta-analyzed included some high and low on any potential moderators), and moderators which appear to "work" probably do so largely because of chance.

In this study, meta-analysis is applied to the results of 43 studies of the relationships between role conflict and ambiguity and 18 of their correlates. The intent is to 1) produce mean correlations to provide a more accurate picture of the magnitude of various relationships, and 2) to discover whether apparently inconsistent results across studies are due largely to artifacts, or whether moderators may be necessary to identify subpopulations with different true correlation values.

METHOD

Correlational studies of the correlates of conflict and ambiguity were identified by means of both manual and computer-assisted searches of the business and social sciences literature between 1970 and mid-1981. A list of studies used appears in the Appendix. A few unpublished studies familiar to the authors were also included, though a thorough search for unpublished results was not undertaken. The argument can be made that unpublished studies differ in results, probably by having fewer significant findings, from published studies. This may be true, but probably would not affect any strong conclusions drawn from the studies we did include. Rosenthal (1979) addressed

this issue, and described a procedure for calculating the number of "hidden" studies with zero effect sizes which would be needed in order to totally invalidate conclusions based on a particular set of studies. Often a great many studies would be needed.[2]

Some studies reported data on more than one separate sample, so that altogether, 59 independent samples were used. For each sample, the following information was recorded: 1) correlations of conflict and ambiguity with any other variables, 2) sample size for each correlation, 3) type of measure and reliability of measure (when available) for conflict, ambiguity, and correlates, and 4) type of subjects (sex, occupational level, type of industry). All but five of the studies employed some form of the self-report measures of conflict and ambiguity developed by Rizzo, House, and Lirtzman (1970). (Meta-analysis does not require that the same instruments be used in all samples, merely that similar constructs be measured.) Eighteen correlates were mentioned in the literature with sufficient frequency to be included in the analyses. "Sufficient" frequency for our purposes meant that data from at least three samples were available, though Hunter (Note 2) states that meta-analysis can correctly be used on as few as two samples. The eighteen variables can be seen in the far left column of Tables 1 and 2.

RESULTS AND DISCUSSION

A Statistical Analysis System (SAS) program was written to perform the basic meta-analysis calculations described in Hunter et al. (Note 1).[3] The program was applied to the correlations of conflict and ambiguity with each of the 18 correlates. The results for role

conflict appear in Table 1, and the results for role ambiguity in Table 2.

Insert Tables 1 and 2 about here

Each table displays the frequency-weighted mean correlation for each correlate across studies, the range of sample correlations and sample sizes, the total number of subjects involved, and the number of studies pertaining to each correlate. As mentioned earlier, the range of values for the same relationship across studies is often large. For example, sample correlations between propensity to leave and role ambiguity range from -.07 to .63. Sample sizes for this relationship varied from 49 to 506, and a total of 14 studies reported propensity to leave-ambiguity correlations. The frequency weighted mean correlation for this relationship is .307.

The far right columns of each table contain figures for the meta-analysis. Total variance in the sample correlations appears in column 7. The variance one would expect due to sampling error was then subtracted, and column 8 shows how much variance remains unexplained. The figures in column 8 are corrected <u>only</u> for sampling error. Variation across studies due to other artifacts such as differential reliability, construct validity, and range restriction could not be estimated or removed since many studies did not report the necessary information. Thus, column 8 may include <u>some</u> variance due to true differences in correlations across sub-populations, but probably also contains substantial variance due to unquantified artifacts.

Hunter et al. (Note 1) give a chi square statistic for testing

whether the remaining variance (column 8) is significantly different from zero, indicating that meaningful variation across samples may exist. However, they state that the test "has very high statistical power and will therefore reject the null hypothesis given a trivial amount of variation across studies. Thus, if the chi square is not significant, this is strong evidence that there is no true variation across studies, but if it is significant the variance may still be negligible in magnitude" (p. 39-40). Chi square values are reported in column 9. To counterbalance the extreme power of the test, a significance level of .01 was adopted.

Population Value Estimates

For some of the relationships investigated, the amount of variance remaining after correcting for sampling error was non-significant. Thus, no evidence for differences in underlying sub-population correlations exists. When artifacts explain most of the variance across samples, the mean correlation is the best estimate of the population value. We can thus conclude that the estimated true relationships, given present measurement methods, are as shown in Table 3.

Insert Table 3 about here

It is possible to determine whether these relationships are significantly different from zero by converting the variances in column 8 into standard deviations. Mean correlations more than two standard deviations from zero are considered significant (Note 2), and are indicated by an asterisk in Table 3. One may thus conclude that

role ambiguity is positively related to educational level, and negatively associated with organizational commitment, job involvement, satisfaction with co-workers and promotion, boundary spanning, tenure, and age. Role conflict is unrelated to self-rated performance and education; positively related to boundary spanning; and negatively related to commitment, involvement, satisfaction with pay, co-workers, and supervision, and participation in decision making. These conclusions are based upon empirical analyses of results across many studies, and should be considered more accurate than the results of any one study, or the results of purely narrative reviews of many studies. For example, the review by Van Sell et al. (1981) concluded that the relationship of organizational commitment to role conflict is still unclear. The present analyses show it to be quite clear, a correlation of -.247, based on 755 subjects from 6 samples, with trivial unexplained variance between samples.

Another relationship, that between conflict and ambiguity, has also appeared to vary quite a bit in past research. Rizzo et al. (1970) originally developed the scales to represent two independent constructs by discarding items which loaded on both factors. Schuler, Aldag, and Brief (1977) assessed the psychometric properties of both scales in six samples, and found that intercorrelations were different across samples, though always positive. In the present study, intercorrelations from 14 samples were subjected to meta-analysis (see Table 1). The mean correlation was .366 and the chi square was significant, indicating that the relationship does vary across samples.

Let us return to considering the correlates starred in column 9 of Tables 1 and 2. These represent relationships in which non-trivial

variance across samples remains after subtracting variance expected due to sampling error. Two explanations of these results are possible. One is that true differences in the relationships exist within sub-populations. This possibility will be discussed later. The second explanation is that the apparent diversity of sample results is due to artifacts which were not measured and subtracted out. For example, differential reliability and/or construct validity of measures across studies may account for the results. It was not possible to directly correct for these, since many studies failed to report reliability, and validity was seldom even mentioned. However, some support for the above artifactual explanation can be inferred from an examination of the correlates which did and did not present significant chi squares in Tables 1 and 2.

Variables which were consistently measured in the same way from study to study, and thus presumably had similar reliability and construct validity, seldom displayed great variability in correlations across samples. For example, commitment, involvement, and satisfaction with pay, co-workers, supervision, and promotion were virtually always measured with the same instruments across studies [respectively, the Mowday, Steers, and Porter (1979) instrument, the Lodahl and Kejner instrument (1965), and the Job Descriptive Index (Smith, Kendall, and Hulin, 1969)]. Correlates for which results varied across studies tended to be those measured in markedly different ways from study to study (tension/anxiety, overall job satisfaction, satisfaction with the work itself/intrinsic satisfaction, and job performance) or one-item measures of questionable reliability (propensity to leave).

Another artifact which was not dealt with directly in the initial

meta-analysis is the possibility of differential restriction in range across samples. Very few authors provided information on means or standard deviations of either conflict and ambiguity measures or correlates. However, since some studies were based on homogeneous samples (same job title) and others on quite heterogeneous samples, it seems likely that the range of conflict and ambiguity probably varied quite a bit from study to study. Since weaker relationships are likely to be observed in the more restricted samples, varying amounts of restriction would contribute to between sample variations in results. We attempted to classify studies as to heterogeneity of sample with the intention of repeating the basic meta-analysis within homogeneous and heterogeneous groupings, but were unable to do so because of inadequate information. While "registered nurses working in hospitals" constitutes a fairly homogeneous sample, the degree of homogeneity in samples of "research professionals," "administrative workers," or "clerical and drafting employees" is unclear.

Our difficulties surely indicate a need for researchers to more carefully report the characteristics of their samples, reliability of all instruments, and means and standard deviations of all variables. If meta-analysis is to be used to its full potential in the future, such data must be available from many of the studies in a given area.

Moderator Analysis

Since all artifacts could not be accounted for, significant remaining variance among sample results could be due to either artifacts or true differences in sub-population values. If the latter is the case, then previous researchers and reviewers have been correct in noting that results across studies did not agree, and in calling

for a search for moderators which identify sub-populations with different correlations. Hunter et al. (Note 1) give two different meta-analysis procedures for locating moderators based on the results of numerous correlational studies. One approach is to divide the studies on the basis of their values on the potential moderator variable (i.e. studies done on high socio-economic status subjects versus studies done on low SES subjects) and then perform the basic meta-analysis procedure within each group of studies. If the $\bar{r}$'s are different, and the unexplained variance across samples is lower in the groups than it was in the total sample, then the grouping variable does have a moderating effect. A second approach involves correlating the observed sample correlations with the values of the potential moderator. For example, if age is the moderator of interest, then mean age of samples would be correlated with the values of the relationship of interest (say, between role ambiguity and performance). A significant positive correlation (when suitably corrected by the formulas given by Hunter, et al., Note 1), would mean that the relationship of interest is stronger, the higher the age of the sample.

Glass (1977) has suggested coding as many study characteristics as possible and then trying each as a moderator. Hunter et al. (Note 1) note that this empiricist approach can lead to the discovery of apparent moderators due to chance alone. We were spared the necessity of choosing between approaches (code <u>all</u> study characteristics versus code only those of theoretical relevance) by the fact that very few characteristics were consistently reported by authors. Sex and mean age of subjects were given by some authors, but only job type was frequently reported. Job type (or organizational "level") has been

suggested before as a potential moderator of role conflict and ambiguity relationships (Morris et al., 1979; Schuler, 1975, 1977; Szilagyi, 1977). Schuler (1975) has made the most specific predictions, arguing that conflict should be more strongly related to satisfaction and performance at lower organizational levels than higher levels, while the reverse should be true for ambiguity. Morris et al. (1979) found that structural antecedents varied by occupational type for role ambiguity but not role conflict. On the other hand, Berkowitz (1980) found no support for organizational level as a moderator in samples of salespeople and sales managers.

Job type is a nominal variable, so the subgrouping rather than correlational approach to finding moderators was used. Three groups of studies were formed based on the job type of subjects: lower level jobs, professional jobs (engineers, nurses, scientists, librarians, teachers), and managerial jobs (all levels). Further subdividing would have resulted in subgroups containing too few observations for analysis. Samples were excluded if they were not described well enough to categorize, or contained subjects from many diverse job types. The results of the moderator analyses are shown in Tables 4 and 5. Note that moderator analyses were performed only for relationships in which significant variance across samples remained after correcting for sampling error.

Insert Tables 4 and 5 about here

Job type is clearly not the only moderator which will be required to understand the variability in sample results. For many of the analyses, one or more job type groups still show significant within

group variance in sample results. However, for some correlates of role conflict, job type is a sufficient moderator. The correlation of role conflict with propensity to leave (Table 4) is uniformly stronger in the professional job group than in the managerial job group, which is in turn stronger than the lower level job group. Similar results obtain for the conflict-ambiguity relationship. For satisfaction with the work itself, the unexplained variance within each group has been reduced to nonsignificance, but the mean correlations of the groups do not differ markedly. Conflict is much more strongly related to tension/anxiety in lower level jobs ($\bar{r}$ = .306) than in managerial jobs ($\bar{r}$ = .178), but no definitive conclusions are possible for this relationship in professional jobs.

For ambiguity, (Table 5), job type moderates both satisfaction with pay and satisfaction with supervision relationships, though not in exactly the same way. Propensity to leave is more strongly related to ambiguity among professionals (.361) than among managers (.217), while the relationship for lower level jobs still varies greatly across samples. Finally, satisfaction with the work itself is more strongly related to ambiguity for managers (-.414) than for lower level employees ($\bar{r}$ = -.257), with the relationship among professionals remaining unclear.

Several conclusions are possible from this moderator analysis. First, job type is a sufficient moderator for a few correlates. For other correlates, grouping by job type gets rid of the variability within one or two groups, while leaving significant variability in the other group(s). Taken together, the various moderating effects found here do not either support or refute Schuler's (1975) predictions about the relative strength of conflict and ambiguity relationships

across organizational levels. Second, further analyses with different moderators will be necessary to thoroughly understand the remaining unexplained variability (assuming that this is true variability, not due to unmeasured artifacts). A third possible conclusion is that these moderator analyses are premature for some correlates, due to the small number of samples (2 or 3) in some of the job type groups.

Conclusions

Past research has produced conflicting and unclear results with regard to the nature and strength of the relationships between role conflict and ambiguity and their hypothesized antecedents and consequences. The intent of this paper has been to reduce this confusion by means of meta-analysis of the results of numerous past studies. For some correlates, we have succeeded, in that the apparent variability in results across samples was shown to be no greater than that expected due to sampling error. For other correlates, occupational type was shown to moderate the relationships such that correlations within an occupational type were not different from each other, while the average correlation across types did differ. However, the results for other correlates are still unclear. For instance, even when controlling for variations in sample size and occupational type, the strength of the relationship between both conflict and ambiguity and overall job satisfaction are still highly variable across samples. This may indicate a need to pursue further moderator research on variables which may have differed across the samples used in this review, such as age, tenure, sex, need for role clarity, and so on. Alternatively, artifacts which could not be controlled for in these meta-analyses may account for much of the

remaining variance. In this case, a search for moderators would be unnecessary, and the mean correlations shown in Tables 1 and 2 can be taken as the best estimates of the strength of the population relationships.

A final object lesson is that researchers should be more careful to report in print any sample characteristics, reliabilities, ranges, and so on which may be required at some future time for the conduct of meta-analysis.

FOOTNOTES

1 Funding for the data analyses was provided by a grant from the Office of Naval Research, N00014-81-K0036, NR170-925. This paper grew out of a session the first author attended at the American Psychological Association Division 14 Innovations in Methodology Conference, held in Greensboro, NC in March, 1981. The session was entitled "Innovative Ways of Cumulating Evidence" and was led by Jack Hunter.

2 Rosenthal's (1978) formula was applied to several subsets of the data for illustrative purposes, and gave the expected results. That is, for variables yielding a reasonable mean effect size ($\bar{r}$), and based on more than just a few samples, many studies would be needed to invalidate our conclusions. For example, 425 studies with zero effect sizes would have to exist in order to invalidate the conclusion based on 13 studies ($\bar{r}$ = -.347) that overall job satisfaction and role conflict are negatively related. For the more modest correlation ($\bar{r}$ = -.22) between role ambiguity and satisfaction with coworkers, 192 studies would be needed. The correlation between education and role ambiguity ($\bar{r}$ = .147) based on six samples, is among the weakest considered significant (see Table 3), and only 17 additional zero effect size studies would be needed to invalidate it.

3 Thanks to Joe Eulberg for writing a SAS program to perform the meta-analysis. Interested readers may obtain a copy of this program from the first author.

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TABLE 1

Information on Role Conflict and 18 Correlates from 42 Studies

1 Correlate	2 mean correlation	3 range of correlations	4 total sample size	5 range of sample sizes	6 number of samples	7 variance in sample correlations	8 unexplained variance[1] in sample correlations	9 chi square
Propensity to leave	.291	.06 to .52	1814	49 to 506	12	.0189	.0133	40.89**
Organizational commitment	-.247	-.12 to -.41	755	55 to 203	6	.0076	.0006	6.48
Job involvement	-.152	.00 to -.21	1220	55 to 399	7	.0035	-.0020	4.44
Tension/anxiety	.275	.12 to .69	1768	61 to 488	12	.0336	.0278	69.52**
Overall job satisfaction	-.347	.13 to -.55	2343	61 to 506	13	.0266	.0222	80.44**
Satisfaction with pay	-.203	-.06 to -.33	2545	50 to 506	12	.0037	-.0006	10.25
Satisfaction with co-workers	-.314	-.11 to -.40	2538	50 to 506	12	.0045	.0006	13.99
Satisfaction with supervisor	-.374	-.28 to -.49	2104	50 to 399	12	.0034	-.0008	9.76
Satisfaction with promotion	-.259	-.14 to -.41	2541	50 to 506	12	.0093	.0052	27.08**
Satisfaction with work itself	-.313	-.07 to -.58	3991	35 to 506	26	.0132	.0079	64.59**
Performance self-rated	-.116	.12 to -.37	797	49 to 302	6	.0166	.0093	13.59
Performance superior-rated	-.086	.08 to -.29	2376	34 to 399	16	.0159	.0093	38.39**
Boundary spanning	.249	.08 to .36	967	51 to 714	3	.0043	.0016	4.78
Participation in decision making	-.276	-.19 to -.30	1200	61 to 714	5	.0004	-.0031	.64
Formalization	-.060	.24 to -.40	984	88 to 252	6	.0475	.0414	47.08*
Tenure	.029	.28 to -.21	[illegible]6	81 to 714	8	.0146	.0101	26.31**
Education	.101	.26 to -.18	19[illegible]	81 to 506	7	.0074	.0038	14.51
Age	-.045	.29 to -.27	712	81 to 252	5	.0232	.0162	16.56**
Role ambiguity	.366	.01 to .50	2521	70 to 399	14	.0170	.0129	57.18**

[1]Variance still unexplained after the removal of variance expected due to sample sizes.

* $p < .01$
** $p < .001$

TABLE 2

Information on Role Ambiguity and 18 Correlates from 42 Studies

1 Correlate	2 mean correlation	3 range of correlations	4 total sample size	5 range of sample sizes	6 number of samples	7 variance in sample correlations	8 unexplained variance[1] in sample correlations	9 chi square
Propensity to leave	.316	-.07 to .63	1963	49 to 506	14	.0192	.0134	46.51**
Organizational commitment	-.340	-.27 to -.43	577	23 to 190	6	.0022	-.0059	1.64
Job involvement	-.264	-.12 to -.37	1354	55 to 399	8	.0068	.0017	10.69
Tension/anxiety	.186	-.07 to .78	1858	27 to 488	16	.0335	.0255	66.89**
Overall job satisfaction	-.251	.05 to -.57	2295	48 to 488	16	.0408	.0347	106.72**
Satisfaction with pay	-.118	.11 to -.56	2041	50 to 399	11	.0129	.0077	27.09*
Satisfaction with co-workers	-.220	-.07 to -.33	2540	50 to 506	12	.0029	-.0014	8.16
Satisfaction with supervisor	-.368	-.16 to -.53	2207	50 to 399	13	.0101	.0057	29.90*
Satisfaction with promotion	-.243	-.12 to -.44	2543	50 to 506	12	.0063	.0022	18.18
Satisfaction with work itself	-.350	-.07 to -.61	4589	35 to 506	31	.0158	.0106	94.12**
Performance self-rated	-.236	.18 to -.49	1035	49 to 203	7	.0277	.0217	32.23**
Performance superior-rated	-.102	.11 to -.36	2596	34 to 399	18	.0166	.0098	43.99**
Boundary spanning	-.142	-.13 to -.31	967	51 to 714	3	.0016	-.0014	1.61
Participation in decision making	-.507	-.25 to -.60	1139	68 to 714	4	.0154	.0135	31.76**
Formalization	-.402	-.23 to -.57	984	88 to 252	6	.0180	.0137	25.20**
Tenure	-.128	-.03 to -.24	1796	81 to 714	8	.0027	-.0016	4.99
Education	.147	.04 to .18	1426	81 to 714	6	.0018	-.0022	2.72
Age	-.174	-.13 to -.29	1127	81 to 506	5	.0034	-.0008	4.06

[1] Variance still unexplained after the removal of variance expected due to sample sizes.

* $p < .01$

** $p < .001$

TABLE 3

Mean Correlations Which Estimate Population Values

Role ambiguity with:	organizational commitment	-.340*
	job involvement	-.264*
	satisfaction with co-workers	-.220*
	satisfaction with promotion	-.243*
	boundary spanning	-.142*
	tenure	-.128*
	education	.147*
	age	-.174*
Role conflict with:	organizational commitment	-.247*
	job involvement	-.152*
	satisfaction with pay	-.203*
	satisfaction with co-workers	-.314*
	satisfaction with supervision	-.374*
	self-rated performance	-.116
	boundary spanning	.249*
	participation in decision making	-.276*
	education	.101

TABLE 4

Moderator Analyses by Job Type for Role Conflict - Correlate Relationships

Correlate	Job type	Mean correlation	Total sample size	Number of samples	Variance in sample correlations	Unexplained variance in sample correlations	Chi square
Propensity to leave	lower	.196	176	2	.0009	-.0096	.17
	professional	.389	944	4	.0031	-.0012	2.43
	managerial	.263	404	4	.0169	.0083	7.88
Tension/anxiety	lower	.306	176	2	.0236	.0143	5.06
	professional	.484	492	3	.0407	.0371	34.16**
	managerial	.178	742	4	.0034	-.0016	2.71
Overall job satisfaction	lower	-.150	203	1	---	---	---
	professional	-.4289	1223	6	.0249	.0198	24.47**
	managerial	-.267	848	5	.0149	.0117	27.47**
Satisfaction with promotion	lower	-.176	563	3	.0009	-.0042	.47
	professional	-.308	1338	6	.0097	.0060	15.84*
	managerial	-.153	241	2	.0006	-.0073	.16
Satisfaction with work itself	lower	-.360	823	6	.0069	.0013	7.48
	professional	-.346	1726	9	.0089	.0048	19.79
	managerial	-.321	753	8	.0148	.0062	13.85
Performance superior-rated	lower	-.088	781	6	.0112	.0037	8.92
	professional	-.130	797	4	.0256	.0207	21.07**
	managerial	-.041	399	5	.0138	.003	5.51
Formalization	insufficient sample size for grouping						
Tenure	insufficient sample size for grouping						
Age	insufficient sample size for grouping						
Role ambiguity	lower	.279	245	3	.0149	.0045	4.29
	professional	.447	576	2	.0051	.0029	4.61
	managerial	.324	487	4	.0172	.0106	10.47

* $p < .01$
** $p < .001$

TABLE 5

Moderator Analyses by Job Type for Role Ambiguity - Correlate Relationships

Correlate	Job type	Mean correlation	Total sample size	Number of samples	Variance in sample correlations	Unexplained variance in sample correlations	Chi square
Propensity to leave	lower	.487	204	2	.0339	.0282	11.88**
	professional	.361	1030	5	.0028	-.0009	3.80
	managerial	.217	439	5	.0212	.0108	10.24
Tension/anxiety	lower	.304	282	4	.0253	.0137	8.68
	professional	.351	398	4	.0007	-.0071	.34
	managerial	.050	686	4	.0370	.0312	25.50**
Overall job satisfaction	lower	-.250	203	1	---	---	---
	professional	-.340	735	5	.0194	.0141	18.22*
	managerial	-.125	934	6	.0361	.0299	34.85**
Satisfaction with pay	lower	-.107	563	3	.0082	.0029	4.70
	professional	-.169	832	5	.0150	.0093	13.23
	managerial	.047	247	2	.0011	-.0069	.27
Satisfaction with supervision	lower	-.309	741	5	.0093	.0037	8.39
	professional	-.360	832	5	.0102	.0057	11.27
	managerial	-.478	235	2	.0000	-.0051	.01
Satisfaction with work itself	lower	-.257	924	7	.0121	.0055	12.83
	professional	-.342	1726	9	.0118	.0077	26.13**
	managerial	-.414	845	9	.0103	.0030	12.66
Performance self-rated	lower	-.109	302	2	.0407	.0343	12.60**
	professional	-.339	488	3	.0089	.0041	5.58
	managerial	-.188	245	2	.0058	-.0018	1.52
Performance superior-rated	lower	-.113	859	7	.0095	.0016	8.41
	professional	-.045	797	4	.0134	.0084	10.75
	managerial	-.103	541	6	.0340	.0231	18.79*
Participation in decision-making	insufficient sample size for grouping						
Formalization	insufficient sample size for grouping						

* $p < .01$
** $p < .001$

Appendix

Studies Included in Meta-analysis

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